

## WEATHER NOTES

### THE UTAH STORM OF APRIL 22-23, 1957

#### INTRODUCTION

The upper air mean trough over the southern Plateau during April 1957 was favorable for intensification of low pressure systems moving into that area during the month. Several heavy storms swept through Utah with the unusual storm of April 22-23 bringing especially large amounts of precipitation to much of the State. Numerous precipitation records were broken and other interesting weather events occurred in this 2-day period.

The surface isobaric pattern preceding and during the heavy precipitation in Utah indicated no intense low pressure systems in the United States west of the Continental Divide. The upper air circulation was of prime importance during the storm so surface conditions will be mentioned only briefly.

#### DEVELOPMENT OF THE STORM

The 5-day period before the arrival of the storm in Utah was characterized by a trough at 500 mb. over western United States and a ridge in the Pacific at about  $150^{\circ}$  W. The 700-mb. mean chart for April 18-22 showed a closed Low over west-central Nevada.

The 500-mb. constant pressure chart for 1500 GMT, April 19 indicated a trough along the Pacific Coast of the United States,

another over the eastern Rocky Mountain States, and a very weak ridge between the two troughs. During the next 24 hours the Pacific trough remained nearly stationary and deepened rapidly, forming a closed Low at  $36^{\circ}$  N.,  $124^{\circ}$  W. which extended to the 200-mb. constant pressure level. The 500-mb. Low moved slowly southeastward and at 0300 GMT, April 22, it was centered on the California-Mexico border. Considerable moisture was being advected into Arizona and Utah at this time.

At 0030 GMT, April 22, a weak surface Low was present over southern Nevada. However, cyclogenesis was occurring over New Mexico and Colorado and by 0630 GMT, April 22 the Nevada Low had nearly disappeared. At this time the principal Low was over western Colorado. Intensification and slow north-northeastward movement of this system placed the center in southeastern Wyoming at 0630 GMT, April 23, with a central pressure of 996 mb., a deepening of about 7 mb. in the preceding 24 hours.

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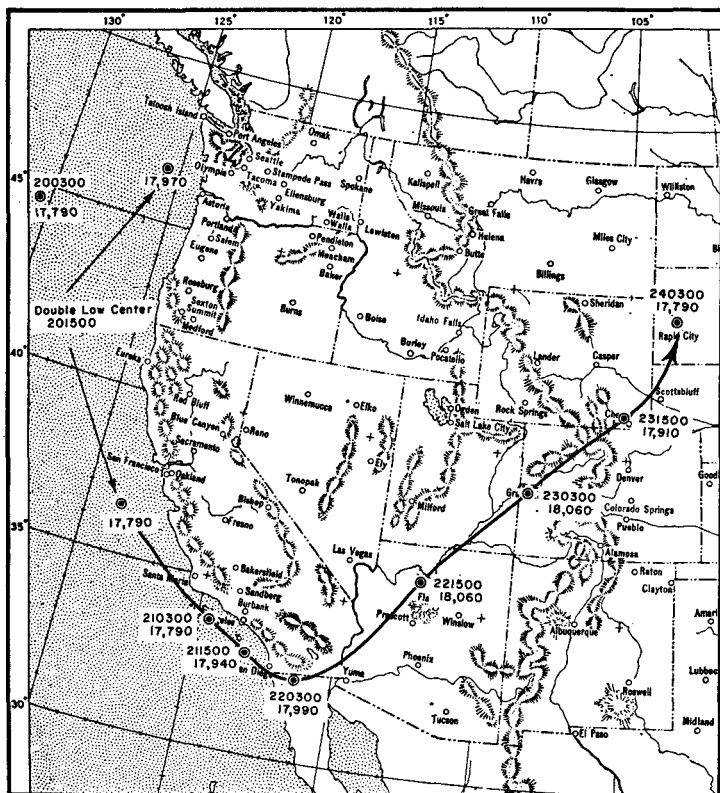


FIGURE 1.—Movement of the 500-mb. Low over western United States, 0300 GMT, April 20 to 0300 GMT, April 24, 1957. Plotted below each position circle is the approximate height, in feet, of the 500-mb. low center. Date and time (GMT) are plotted above.

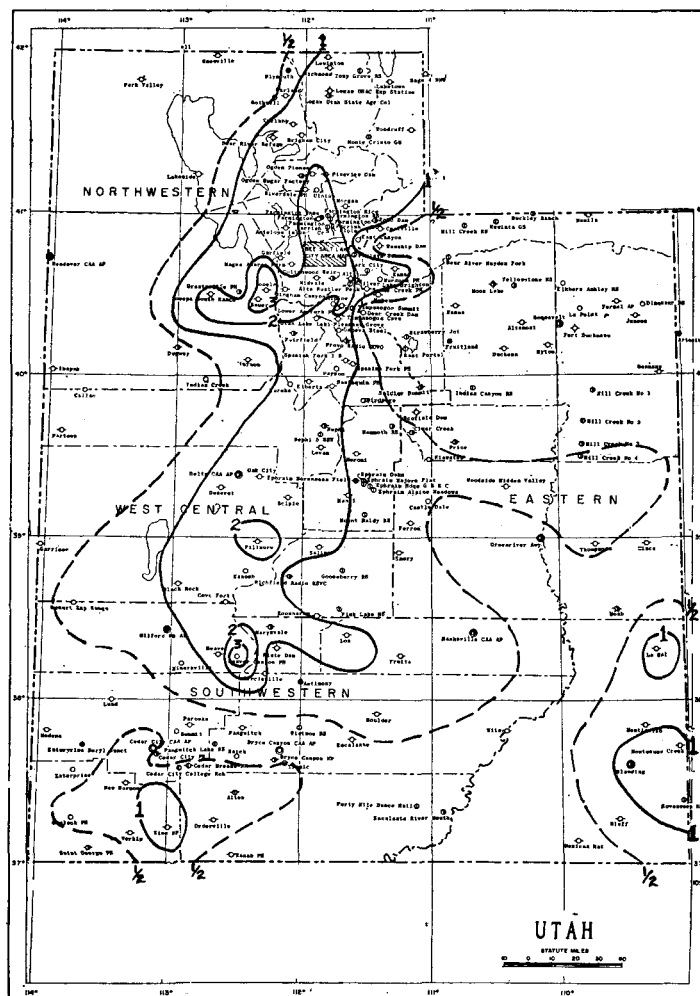


FIGURE 2.—Total precipitation (inches) in Utah, for April 22-23, 1957.

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The 500-mb. Low on the California-Mexico border at 0300 GMT, April 22, moved sharply northeastward and 24 hours later was centered in west-central Colorado (see fig. 1 for the storm track at the 500-mb. level). Light precipitation was reported at scattered points in Utah and other portions of western United States on the 21st. As the cold Low aloft moved across the area on the 22d precipitation increased markedly, with much of Utah receiving moderate to heavy rain or snow. Precipitation was widespread over the State until 1500 GMT, April 23, when the 500-mb. Low was located over southeastern Wyoming.

## PRECIPITATION

An isohyetal map for the Utah storm of April 22-23, 1957, is shown in figure 2. Precipitation was heaviest over north-central Utah, although most of the State received substantial amounts of moisture. Some of the heavier totals reported during the 2-day period were: Tooele 3.20 inches; Bauer 3.13; Beaver Canyon Power House 3.06; University of Utah at Salt Lake City 2.96; City Creek Water Plant (near Salt Lake City) 2.89, and Lower American Fork 2.69. Park Valley, in northwestern Utah, was the only station in Utah that did not report at least a trace during the storm.

Some of the precipitation was in the form of snow over much of the area. Beaver Canyon Power House, Silver Lake Brighton, and Timpanogos Cave, all mountain stations, received 29, 20.5, and 18 inches respectively; Cedar Point had 12 inches, Utah Lake Lehi 8 inches, and Tropic 7 inches. Four inches of wet snow fell at the Salt Lake City Airport, but only a trace was reported at Bountiful, a few miles to the northeast and at a higher elevation. In some sections, the heavy snow broke down power and telephone lines and numerous tree branches. The heavy rain and runoff from melting snow caused

TABLE 1.—April precipitation records for Utah stations for the 24-hour period ending at observation time each day. The new records were established during the storm of April 22-23, 1957

Station	New record for April (in.)	Previous April record and date (in.)	Years of record
Alpine.....	1.77	1.60 (10/1905)	59
Beaver Canyon Power House.....	1.82	1.35 (28/1953)	18
Brigham City.....	1.68	1.30 (5/1929)	50
City Creek Water Plant.....	2.62	1.80 (6/1919)	40
Corinne.....	1.24	1.20 (10/1943)	85
Cottonwood Weir*.....	1.86	1.64 (16/1944)	40
Echo Dam.....	1.25	.67 (9/1947)	18
Farmington (Miller Floral).....	2.37	1.85 (9/1953)	63
Fillmore.....	2.21	1.66 (1/1906)	66
Garland.....	.99	.98 (20/1947)	28
Grantsville*.....	1.12	1.08 (2/1913)	43
Lower American Fork Power House.....	**2.38	1.39 (29/1951)	44
Logan, Utah, State Agricultural College*.....	1.73	1.43 (20/1944)	66
Mountain Dell Dam.....	2.11	1.04 (5/1938)	38
Ogden Pioneer Power House.....	1.94	1.80 (28/1932)	88
Ogden Sugar Factory.....	1.55	1.50 (27/1932)	33
Richmond.....	1.54	1.37 (14/1921)	45
Riverdale Power House.....	2.18	1.80 (28/1932)	44
Terminal.....	1.78	1.10 (16/1941)	18
Tooele.....	2.10	1.56 (8/1900)	61
University of Utah.....	**2.95	1.43 (15/1952)	18
Utah Lake Lehi.....	1.25	1.00 (18/1909)	52
Woodruff.....	1.43	.98 (2/1940)	61

\*All precipitation amounts in this table are for the 24-hour period ending at observation time. See table 2 for record April precipitation amounts for 24-hour periods beginning on any hour of the day.

\*\*All-time record for the station for any month.

TABLE 2.—New precipitation records for Utah for 3, 6, 12, and 24-hour periods for the month of April. These data were taken from recording rain gage charts of April 22-23, 1957, and the various periods begin on any hour of the day

Station	Duration (hours)				Years of record
	3	6	12	24	
	(in.)	(in.)	(in.)	(in.)	
Cottonwood Weir.....				2.52	14
Farmington Warehouse.....				2.38	15
Grantsville.....	0.55		0.90	1.10	15
Logan, Utah, State Agricultural College.....		1.08	1.83	2.10	16
Salt Lake City (downtown).....			*1.75	2.47	65
Salt Lake City Airport.....	.60	.80	1.79	**2.41	22

\*Estimated.

\*\*All-time record for the station for any month.

minor local flooding. Some losses to livestock and damage to fruit trees were also reported.

Several precipitation records were broken during the storm and these are tabulated in tables 1 and 2. Only stations with 10 or more years of record are included.

Probably the most outstanding record established during the storm was at the University of Utah, Salt Lake City, where 2.95 inches of precipitation fell in a 1-day period. This is the largest 24-hour amount ever recorded in the Salt Lake area.

Other all-time 24-hour precipitation records (for any month) established were: 2.41 inches at the Salt Lake Airport and 2.38 inches at Lower American Fork Power House.—*Merle J. Brown, State Climatologist, U. S. Weather Bureau, Salt Lake City, Utah.*

## WORLD RECORD LOW TEMPERATURE

SOUTH POLE, SEPTEMBER 18, 1957

E. J. Flowers, Chief Meteorologist at the Amundsen-Scott IGY Station (South Pole), has reported that a new world record low air temperature,  $-102.1^{\circ}\text{F.}$ , was observed at screen level (2 m.) at 2137 GMT on September 18, 1957. (See p. 207 of June 1957 *Monthly Weather Review* for his report of the previous world record of  $-100.4^{\circ}\text{F.}$  which occurred on May 11, 1957.) The wind and temperature report follows:

2137 GMT Sept. 18, 1957, Amundsen-Scott IGY Station

Wind		Temperature ( $^{\circ}\text{F}$ )			
Direction (merid-ian)	Speed (kt)	Surface	Air		
			2 m.	5 m.	10 m.
110 E	4	-103.3	-102.1	-101.0	-79.5

An earlier dispatch reported the new record as occurring on September 17, but two subsequent messages from the South Pole station reported the occurrence on September 18. It is expected that a more detailed note by Mr. Flowers concerning this new record and the attendant weather conditions will be published in a future issue of the *Review*.—*Ed.*